**Pond Discharge Notification Coversheet**
**Date: 5/18/09**
**Total pages including coversheet = (13)**

**To:**

| | | |
|---|---|---|
| **Carl Spreng** | **CDPHE** | **carl.spreng@state.co.us** |
| **Vera Moritz** | **EPA** | **moritz.vera@epa.gov** |
| **Steve Berendzen** | **USFWS** | **steve_berendzen@fws.gov** |
| **Bruce Hastings** | **USFWS** | **bruce_hastings@fws.gov** |
| **Mike Bartleson** | **Broomfield** | **mbartleson@ci.broomfield.co.us** |
| **Shirley Garcia** | **Broomfield** | **sgarcia@ci.broomfield.co.us** |
| **Craig Hoffman** | **Broomfield** | **choffman@ci.broomfield.co.us** |
| **Laura Hubbard** | **Broomfield** | **lhubbard@ci.broomfield.co.us** |
| **Dan Mayo** | **Broomfield** | **dmayo@ci.broomfield.co.us** |
| **Kathy Schnoor** | **Broomfield** | **kschnoor@ci.broomfield.co.us** |
| **Shelley Stanley** | **Northglenn** | **sstanley@northglenn.org** |
| **David Allen** | **Northglenn** | **dallen@northglenn.org** |
| **Bud Hart** | **Thornton** | **bud.hart@cityofthornton.net** |
| **Scott Niebur** | **Thornton** | **scott.niebur@cityofthornton.net** |
| **Bob Krugmire** | **Westminster** | **bkrugmir@ci.westminster.co.us** |
| **Cathy Shugarts** | **Westminster** | **cshurgarts@ci.westminster.co.us** |
| **Mark Gutke** | **JeffCo** | **mgutke@co.jefferson.co.us** |
| **Paul Winkle** | **DOW** | **paul.winkle@state.co.us** |
| **David Abelson** | **RFSC** | **dabelson@rockyflatssc.org** |

**From: George Squibb, Rocky Flats Surface Water Lead, Telephone (303) 994-0145**

**Re: Discharge notification for Rocky Flats Pond B-5.**

**Pre-discharge samples for Pond B-5 were collected on 4/22/09. All results indicate that water quality is acceptable for discharge. Discharge of Pond B-5 is scheduled to begin on 5/19/09 at 9:00 am.**

**Pond B-5 will be direct discharged using the outlet works to South Walnut Creek through POC GS08. The discharge is expected to continue through approximately 6/2/09, with a total discharge volume of approximately 11.3 MG.**

**All available analytical data accompany this notice, and all data show the water quality meets applicable surface-water standards.**

**Please contact me if you have questions.**

Bill Ritter, Jr., Governor
James B. Martin, Executive Director

# STATE OF COLORADO

Dedicated to protecting and improving the health and environment of the people of Colorado

Laboratory Services Division
8100 Lowry Boulevard Denver, CO 80230
PO Box 17123 Denver, CO 80217
303-692-3090
www.cdphe.state.co.us/lr

Colorado Department of Public Health and Environment

## Laboratory Results For Sample Number: ENV-2009004176-

Site ID/PWSID

Site Address

Site Description ROCKY FLATS POND B5 SURFACE WATER

Customer ID 00008835

Customer CDPHE - HMWMD - Rocky Flats Unit
4300 Cherry Creek Drive South

Denver CO 80246

Contact Carl Spreng
Phone x3358
Fax
Email

Collected By AC
Collected 04/21/2009 12:00:00
Received 04/27/2009 14:15:00
Reported 05/18/2009 00:00:00
Bottles 4 OTHER
Matrix Surface Water
Field Fluoride
Residual Chlorine
Temperature at Receipt

| Test Name | Result | Units | MCL | MRL | Method Name | Date Analyzed | Qualifier |
|---|---|---|---|---|---|---|---|
| Nitrogen, Nitrate/Nitrite | 0.71 | mg/L | NA | 0.1 | EPA 353.2 | 04/29/2009 00:00:00 | |
| Uranium, Total | 0.006 | mg/L | NA | 0.001 | EPA 200.8 | 05/04/2009 00:00:00 | |
| Americium-241 | 0.018 +/- 0.008 | pCi/L | NA | 0.001 | ASTM-3084-89 | 05/15/2009 00:00:00 | |
| Plutonium-239+240 | < 0.04 | pCi/L | NA | 0.04 | ASTM-3084-89 | 05/15/2009 00:00:00 | |

Comments:

Registry Comments:
PRE-DISCHARGE SAMPLING

RUSH

*MRL - Minimum Reporting Limit. MCL - Maximum Contaminant Limit per EPA regulations.*
*BDL - Below Detection Limit. H - Holding Time exceeded. Q - Quality Control limit exceeded. NT - No Test.*
*Units: mg/L - milligrams per liter (ppm), ug/L - micrograms per liter (ppb), pCi/L - picoCuries per liter*
LSD Internet Address: http://www.cdphe.state.co.us/lr/lrhom.htm

**PRELIMINARY RESULTS REPORT**
**RIN: 09042246**
**Site: Rocky Flats Surface Water**
**Location: B5 POND**
**Ticket Number: HFW 920**
**Report Date: 5/11/2009**

| Parameter | Units | Date Sampled | Date Analyzed | Result | Qualifier(s) | Uncertainty | Detection Limit | Method |
|---|---|---|---|---|---|---|---|---|
| Americium-241 | pCi/L | 04/22/2009 | 05/01/2009 | 0.00305 | U | 0.0128 | 0.0158 | Am-05-RC Modified |
| Plutonium-238 | pCi/L | 04/22/2009 | 05/04/2009 | 0.00 | U | 0.00238 | 0.0174 | Pu-11-RC Modified |
| Plutonium-239/240 | pCi/L | 04/22/2009 | 05/04/2009 | 0.0254 | | 0.0116 | 0.0193 | Pu-11-RC Modified |
| Arsenic | ug/L | 04/22/2009 | 05/04/2009 | 1.50 | U | | 1.50 | EPA 3005/6020 |
| Uranium | ug/L | 04/22/2009 | 05/04/2009 | 5.55 | | | 0.050 | EPA 3005/6020 |
| NO2+NO3 as N | mg/L | 04/22/2009 | 04/28/2009 | 0.670 | | | 0.050 | EPA 353.2 |

U.S. DEPARTMENT OF ENERGY | Office of Legacy Management

# *Data Review and Validation Report*

General Information

| | |
|---|---|
| Report Number (RIN): | 09042246 |
| Sample Event: | April 22, 2009 |
| Site(s): | Rocky Flats, Colorado; Surface Water |
| Laboratory: | GEL Laboratories, Charleston, South Carolina |
| Work Order No.: | 228541 |
| Analysis: | Metals, Wet Chemistry, and Radiochemistry |
| Validator: | Gretchen Baer |
| Review Date: | May 11, 2009 |

This validation was performed according to the *Environmental Procedures Catalog* (STO 6), "Standard Practice for Validation of Laboratory Data," GT-9(P). The procedure was applied at Level 3, Data Validation. See attached Data Validation Worksheets for supporting documentation on the data review and validation. All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 1.

*Table 1. Analytes and Methods*

| Analyte | Line Item Code | Prep Method | Analytical Method |
|---|---|---|---|
| Americium-241 | ASP-A-020 | HASL-300, Am-05 | HASL-300, Am-05-RC |
| Arsenic, Uranium | LMM-02 | SW-846 3005A | SW-846 6020 |
| Nitrate + Nitrite as N | WCH-A-022 | MCAWW 353.2 | MCAWW 353.2 |
| Plutonium Isotopes | LMR-08 | HASL-300, Pu-11 | HASL-300, Pu-11-RC |

Data Qualifier Summary

Analytical results were qualified as listed in Table 2. Refer to the sections below for an explanation of the data qualifiers applied.

*Table 2. Data Qualifier Summary*

| Sample Number | Location | Analyte(s) | Flag | Reason |
|---|---|---|---|---|
| 228541-001 | B5 POND | Nitrate + Nitrite as N | J | Incorrect preservation |
| 228541-001 | B5 POND | Plutonium-239/240 | J | Less than 3 times the MDC |

Sample Shipping/Receiving

GEL Laboratories in Charleston, South Carolina, received one water sample on April 24, 2009, under air bill number 7975 3324 2124, accompanied by a Chain of Custody (COC) form. The COC form was checked to confirm that all of the samples were listed with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The COC form was complete with no errors or omissions. An adhesive note attached to the COC requested the laboratory to change the dates on the bottle labels to April 22, 2009.

Preservation and Holding Times

The sample shipment was received intact and at ambient temperature, which does not comply with requirements. The nitrate + nitrite as N method requires cold preservation; the sample nitrate + nitrite as N result is qualified with a "J" flag as an estimated value. All other sample aliquots were preserved correctly. The sample aliquiots were received in the correct container types and were analyzed within the applicable holding times.

Laboratory Instrument Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear curve. Compliance requirements for continuing calibration checks are established to ensure that the instrument continues to be capable of producing acceptable qualitative and quantitative data. All laboratory instrument calibrations were performed correctly in accordance with the cited methods.

*Method MCAWW 353.2, Nitrate + Nitrite as N*
Calibrations were performed using five calibration standards on April 28, 2009. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than three times the method detection limit (MDL). Initial and continuing calibration verification checks were made at the required frequency resulting in two verification checks. All calibration check results were within the acceptance criteria.

*Method SW-846 6020, Arsenic and Uranium*
Calibrations were performed on May 4, 2009, using two calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than three times the MDL. Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification checks were made at the required frequency resulting in five verification checks. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the practical quantitation limit and all results were within the acceptance range. Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure. Internal standard recoveries associated with requested analytes were stable and within acceptable ranges.

Radiochemical Analysis

Radiochemical results are qualified with a "J" flag (estimated) when the result is greater than the minimum detectable concentration (MDC), but less than three times the MDC. Radiochemical results are qualified with a "U" flag (not detected) when the result is greater than the MDC, but less than the two sigma total propagated uncertainty (TPU).

*Alpha Spectrometry*

Alpha spectrometry calibrations were performed in April and May 2009. Calibration standards were counted to obtain a minimum of 10,000 counts per peak. Instrument background was determined in April and May 2009. Daily instrument checks met the acceptance criteria. The tracer recoveries met the acceptance criteria of 30 to 110 percent for all samples. The full width at half maximum (FWHM) was reviewed to evaluate the spectral resolution. All internal standard FWHM values were below 100 kiloelectron volts (keV), demonstrating acceptable resolution. All internal standard peaks were within 50 keV of the expected position. The regions of interest (ROIs) for analyte peaks were reviewed. No manual integrations were performed and all ROIs were satisfactory. All results were blank-corrected using data from a blank population. Americium-241 results were corrected for tracer impurity.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis.

All method blank and calibration blank results associated with metals and wet chemistry samples were below the practical quantitation limits and method detection limits for all analytes. The radiochemistry method blank results were less than 1.65 times the respective total propagated uncertainty (TPU) or below the minimum detectable concentration.

Inductively Coupled Plasma (ICP) Interference Check Sample (ICS) Analysis

ICP interference check samples ICSA and ICSAB were analyzed at the required frequency to verify the instrumental interelement and background correction factors. All ICSAB check sample results met the acceptance criteria.

Matrix Spike Analysis

Matrix spike (MS) samples are used to measure method performance in the sample matrix. The MS analyses for all analytes resulted in acceptable recoveries. The MS, laboratory duplicate, and serial dilution for metals were performed on sample location GS10 (RIN 09042245, Rocky Flats surface water), which is acceptable.

Laboratory Duplicate Analysis

Laboratory replicate sample results demonstrate acceptable laboratory precision. The relative percent difference values for the non-radiochemical sample replicates were less than 20 percent for results that are greater than five times the practical quantitation limit, indicating acceptable

precision. The radiochemical relative error ratios (calculated using the one-sigma total propagated uncertainty) for the sample replicates were less than three, indicating acceptable precision.

Laboratory Control Sample

Laboratory control samples were analyzed at the correct frequency to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. All control sample results were acceptable.

Metals Serial Dilution

Serial dilutions were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. ICP-MS serial dilution data are evaluated when the concentration of the undiluted sample is greater than 100 times the practical quantitation limit. All evaluated serial dilution data were acceptable.

Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required. The required detection limits (RDLs) were met for all metals and wet chemistry analytes. The arsenic detection limit was 1.5 µg/L, which is above the Line Item Code RDL of 0.1 µg/L, but is acceptable for this project.

All radiochemical minimum detectable concentrations (MDCs) were calculated using data from a blank population and the following equation as specified in *Quality Systems for Analytical Services*.

$$MDC = \frac{3.29 \times S_b}{K \times T} + \frac{3}{K \times T}$$

Where:
$S_b$ = Standard deviation of the blank population counts
K = Efficiency factor
T = Count time in minutes

The calculation of the MDCs using the equation above was verified. All reported MDCs were less than the required MDCs.

Completeness

Results were reported in the correct units for all analytes requested using contract-required laboratory qualifiers. The analytical report included the MDL (MDC for radiochemistry) and practical quantitation limit for all analytes and all required supporting documentation.

Electronic Data Deliverable (EDD) File

The EDD file arrived on May 8, 2009. The Sample Management System EDD validation module was used to verify that the EDD file was complete and in compliance with requirements. The module compares the contents of the file to the requested analyses to ensure all and only the requested data are delivered. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package.

Outliers Report

Potential outliers are measurements that are extremely large or small relative to the rest of the data and, therefore, are suspected of misrepresenting the population from which they were collected. Potential outliers may result from transcription errors, data-coding errors, or measurement system problems. However, outliers may also represent true extreme values of a distribution and indicate more variability in the population than was expected.

Statistical outlier tests give probabilistic evidence that an extreme value does not "fit" with the distribution of the remainder of the data and is therefore a statistical outlier. These tests should only be used to identify data points that require further investigation. The tests alone cannot determine whether a statistical outlier should be discarded or corrected within a data set.

There are three steps involved in identifying extreme values or outliers:

1. Identify extreme values that may be potential outliers by generating the Outliers Report using the Sample Management System from data in the SEEPro database. The application compares the new data set with historical data and lists all new data that fall outside the historical data range. Data listed in the report are highlighted if the concentration detected is not within 50 percent of historical minimum or maximum values. A determination is also made if the data are normally distributed using the Studentized Range Test.
2. Apply the appropriate statistical test. Dixon's Extreme Value test is used to test for statistical outliers when the sample size is less than or equal to 25. This test considers both extreme values that are much smaller than the rest of the data (case 1) and extreme values that are much larger than the rest of the data (case 2). This test is valid only if the data without the suspected outlier are normally distributed. Rosner's Test is a parametric test that is used to detect outliers for sample sizes of 25 or more. This test also assumes that the data without the suspected outliers are normally distributed.
3. Scientifically review statistical outliers and decide on their disposition.

No values from this sampling event were identified as potential outliers. The data for this RIN are acceptable as qualified

Report Prepared By: _____

Gretchen Baer
Data Validator

# SAMPLE MANAGEMENT SYSTEM

## General Data Validation Report

**RIN:** 09042246 **Lab Code:** GEN **Validator:** Gretchen Baer **Validation Date:** 5/11/2009

**Project:** Rocky Flats Surface Water **Analysis Type:** ☑ Metals ☑ General Chem ☑ Rad ☐ Organics

**# of Samples:** 1 **Matrix:** Water **Requested Analysis Completed:** Yes

**Chain of Custody**

**Present:** OK **Signed:** OK **Dated:** OK

**Sample**

**Integrity:** OK **Preservation:** OK **Temperature:** NO

**Select Quality Parameters**

- ☑ Holding Times
- ☑ Detection Limits
- ☐ Field/Trip Blanks
- ☐ Field Duplicates

All analyses were completed within the applicable holding times.

There are 1 detection limit failures.

# SAMPLE MANAGEMENT SYSTEM

## Non-Compliance Report: Detection Limits

**RIN:** 09042246 **Lab Code:** GEN

**Project:** Rocky Flats Surface Water

**Validation Date:** 5/11/2009

| Ticket | Location | Lab Sample ID | Method Code | Lab Method | Analyte Name | Result | Qualifier | Reported Detection Limit | Required Detection Limit | Units |
|---|---|---|---|---|---|---|---|---|---|---|
| HFW 920 | B5 POND | 228541001 | LMM-02 | EPA 3005/6020 | Arsenic | 1.50 | U | 1.5 | 0.1 | ug/L |

# SAMPLE MANAGEMENT SYSTEM

## Metals Data Validation Worksheet

**RIN:** 09042246 **Lab Code:** GEN **Date Due:** 5/8/2009

**Matrix:** Water **Site Code:** RFS02 **Date Completed:** 5/8/2009

| Analyte | Date Analyzed | CALIBRATION | | | | | | Method Blank | LCS %R | MS %R | MSD %R | Dup. RPD | ICSAB %R | Serial Dil. %R | CRI %R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Int. | R^2 | ICV | CCV | ICB | CCB | | | | | | | | |
| Arsenic | 05/04/2009 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 91.7 | 93.0 | | | 99.2 | | 88.7 |
| Uranium | 05/04/2009 | 0.0000 | 1.0000 | OK | OK | OK | OK | OK | 97.5 | 92.9 | | 2.0 | 101.0 | 0.9 | 128.0 |

# SAMPLE MANAGEMENT SYSTEM

## Wet Chemistry Data Validation Worksheet

**RIN:** 09042246 **Lab Code:** GEN **Date Due:** 5/8/2009

**Matrix:** Water **Site Code:** RFS02 **Date Completed:** 5/8/2009

| Analyte | Date Analyzed | CALIBRATION | | | | | | Method Blank | LCS %R | MS %R | MSD %R | DUP RPD | Serial Dil. %R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Int. | R^2 | ICV | CCV | ICB | CCB | | | | | | |
| NO2+NO3 as N | 04/28/2009 | -0.006 | 0.9998 | OK | OK | OK | OK | OK | 99.20 | 98.6 | | 1.00 | |

# SAMPLE MANAGEMENT SYSTEM
## Radiochemistry Data Validation Worksheet

**RIN:** 09042246 **Lab Code:** GEN **Date Due:** 5/8/2009

**Matrix:** Water **Site Code:** RFS02 **Date Completed:** 5/8/2009

| Sample | Analyte | Date Analyzed | Result | Flag | Tracer %R | LCS %R | MS %R | Duplicate |
|---|---|---|---|---|---|---|---|---|
| B5 POND | Americium-241 | 05/01/2009 | | | 78.0 | | | |
| LCS | Americium-241 | 05/01/2009 | | | 80.0 | 90.5 | | |
| B5 POND | Americium-241 | 05/01/2009 | | | 88.0 | | 86.2 | |
| Blank | Americium-241 | 05/01/2009 | -0.0044 | U | 57.0 | | | |
| B5 POND | Americium-241 | 05/04/2009 | | | 54.0 | | | 1.32 |
| B5 POND | Plutonium-238 | 05/04/2009 | | | 78.0 | | | |
| B5 POND | Plutonium-238 | 05/04/2009 | | | 71.0 | | | 0 |
| B5 POND | Plutonium-238 | 05/04/2009 | | | 69.0 | | | |
| Blank | Plutonium-238 | 05/06/2009 | -0.0057 | U | 71.0 | | | |
| B5 POND | Plutonium-239/240 | 05/04/2009 | | | | | | 1.06 |
| LCS | Plutonium-239/240 | 05/04/2009 | | | | 105.0 | | |
| B5 POND | Plutonium-239/240 | 05/04/2009 | | | | | 102.0 | |
| Blank | Plutonium-239+240 | 05/06/2009 | 0.0019 | U | | | | |